Amendments to the Claims

Claim 1 **(Currently Amended)** An optical transmission system ~~for transmitting an optical signal through a multi-mode fiber, the optical transmission system~~ comprising:

a transmitter for transmitting an optical signal through a multi-mode fiber, said transmitter including ~~comprising~~:

a light emission element for generating an optical signal; and

at least one lens having an optical axis and a vertex for converging the optical signal generated by said light emission element, wherein

the optical signal converged by said at least one lens enters an input plane of the multi-mode fiber to propagate through the multi-mode fiber,~~; and~~

~~a receiver comprising a light receiving element for receiving the optical signal outputted from the multi-mode fiber, wherein~~

the ~~an~~ optical axis ~~of said at least one lens~~ is aligned with a fiber axis of the multi-mode fiber,

the ~~a~~ vertex ~~of said at least one lens~~ is located at a predetermined distance from the input plane of the multi-mode fiber,

the predetermined distance is ~~being~~ greater or less than a distance from the vertex ~~of said at least one lens~~ to a focal point of said at least one lens, and

the predetermined distance is determined ~~selected~~ based on an eye opening factor of the multi-mode fiber and a power of the optical signal, so that a numerical aperture of the optical signal is equal to or less than a first given value and the power of the optical signal is equal to or greater than a second given value; and

a receiver including a light receiving element for receiving the optical signal outputted from the multi-mode fiber.

Claim 2 **(Previously Presented)** The optical transmission system according to claim 1, wherein the input plane of the multi-mode fiber is placed at a position farther away from said at least one lens than the focal point of said at least one lens.

Claim 3 **(Currently Amended)** A transmitter for outputting an optical signal toward a multi-mode fiber, the transmitter comprising:

a light emission element for generating an optical signal; and

at least one lens having an optical axis and a vertex for converging the optical signal generated by said light emission element, wherein

the optical signal converged by said at least one lens enters an input plane of the multi-mode fiber to propagate through the multi-mode fiber,

the ~~an~~ optical axis ~~of said at least one lens~~ is aligned with a fiber axis of the multi-mode fiber,

the ~~a~~ vertex ~~of said at least one lens~~ is located at a predetermined distance from the input plane of the multi-mode fiber,

the predetermined distance is ~~being~~ greater or less than a distance from the vertex ~~of said at least one lens~~ to a focal point of said at least one lens, and

the predetermined distance is determined ~~selected~~ based on an eye opening factor of the multi-mode fiber and a power of the optical signal, so that a numerical aperture of the optical signal is equal to or less than a first given value and the power of the optical signal is equal to or greater than a second given value.

Claim 4 **(Previously Presented)** The transmitter according to claim 3, wherein the input plane of the multi-mode fiber is placed at a position farther away from said at least one lens than the focal point of said at least one lens.

Claim 5 **(Previously Presented)** The transmitter according to claim 3, further comprising a receptacle for connecting to the multi-mode fiber to affix the input plane of the multi-mode fiber at a position other than the focal point of said at least one lens.

Claim 6 **(Currently Amended)** An optical transmission system ~~for transmitting an optical signal through a multi-mode fiber, the optical transmission system~~ comprising:

a transmitter for transmitting an optical signal through a multi-mode fiber including ~~comprising~~:

a light emission element for generating an optical signal; ~~signal,~~ and

at least one lens having an optical axis and a vertex for converging the optical signal generated by said light emission element,

wherein the optical signal converged by said at least one lens enters an input plane of the multi-mode fiber, propagates through the multi-mode fiber, and is outputted from an output plane of the multi-mode fiber; and

a receiver including ~~comprising~~:

a light receiving element having a light-receiving plane for receiving the optical signal from the output plane of the multi-mode fiber; and

a receptacle for connecting to the multi-mode fiber to affix the output plane of the multi-mode fiber at a predetermined distance from the light-receiving plane, wherein

said light receiving element receives a lower order mode of the optical signal and a higher order mode is prevented from entering the light-receiving plane of said light receiving element, and

the predetermined distance is determined based on a core diameter of the multi-mode fiber, a diameter of the light-receiving plane, and a maximum angle among angles of modes of the optical signal outputted from the output plane of the multi-mode fiber which are capable of entering the light-receiving plane, so that a numerical number of the light-receiving plane is equal to or less than a given value.

Claim 7 **(Previously Presented)** The optical transmission system according to claim 6, wherein said light receiving element is a Si PIN photodiode.

Claim 8 **(Currently Amended)** A receiver for receiving an optical signal outputted from a multi-mode fiber, the receiver comprising:

a light receiving element having a light-receiving plane for receiving the optical signal from an output plane of the multi-mode fiber; and

a receptacle for connecting to the multi-mode fiber to affix the output plane of the multi-mode fiber at a predetermined distance from the light-receiving plane, wherein

said light receiving element receives a lower order mode of the optical signal and a higher order mode is prevented from entering the light-receiving plane of said light receiving element, and

the predetermined distance is determined based on a core diameter of the multi-mode fiber, a diameter of the light-receiving plane, and a maximum angle among angles of modes of the optical signal outputted from the output plane of the multi-mode fiber which are capable of entering the light-receiving plane, so that a numerical number of the light-receiving plane is equal to or less than a given value.

Claim 9 **(Currently Amended)** An optical transmission system ~~for transmitting an optical signal through a multi-mode fiber, the optical transmission system~~ comprising:

a transmitter for transmission an optical signal through a multi-mode fiber, said transmitter including ~~comprising~~:

a light emission element for generating an optical signal; and

at least one lens having an optical axis and a vertex for converging the optical signal generated by said light emission element, wherein

the optical signal converged by said at least one lens enters an input plane of the multi-mode fiber, propagates through the multi-mode fiber, and is outputted from an output plane of the multi-mode fiber,

the ~~an~~ optical axis ~~of said at least one lens~~ is aligned with a fiber axis of the multi-mode fiber,

the ~~a~~ vertex ~~of said at least one lens~~ is located at a first predetermined distance from the input plane of the multi-mode fiber,

the first predetermined distance is ~~being~~ greater or less than a distance from the vertex of said at least one lens to a focal point of said at least one lens, and

the first predetermined distance is determined ~~selected~~ based on an eye opening factor of the multi-mode fiber and a power of the optical signal, so that a numerical aperture is equal to or less than a first given value and the power of the optical signal is equal to or greater than a second given value; and

a receiver including ~~comprising~~:

a light receiving element having a light-receiving plane for receiving the optical signal from the output plane of the multi-mode fiber; and

a receptacle for connecting to the multi-mode fiber to affix the output plane of the multi-mode fiber at a second predetermined distance from the light-receiving plane, wherein

_____said light receiving element receives a lower order mode of the optical signal and a higher order mode is prevented from entering the light-receiving plane of said light receiving element, and

_____the second predetermined distance is determined based on a core diameter of the multi-mode fiber, a diameter of the light-receiving plane, and a maximum angle among angles of modes of the optical signal outputted from the output plane of the multi-mode fiber which are capable of entering the light-receiving plane, so that a numerical aperture of the light-receiving plane is equal to or less than a third given value.

Claim 10 **(Previously Presented)** The optical transmission system according to claim 9, wherein the input plane of the multi-mode fiber is placed at a position farther away from a vertex of said at least one lens than the focal point of said at least one lens.

Claim 11 **(Previously Presented)** The optical transmission system according to claim 9, wherein said light receiving element is a Si PIN photodiode.